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Customer No.: 31561
Application No.: 10/709,953
Docket No.: 10546-US-PA

REMARKS

Present Status of the Application

The Office Action rejected claims 1-3, 8-12, and 16-20. Specifically, claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (U. S. Patent 6,583,516). Claims 1 to 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elenius et al. (U. S. Patent 6,287,893, hereinafter Elenius). Claims 8 to 12 and 16 to 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto or Elenius. Applicants have amended claims 1-3 to improve clarity without subjecting to Doctrine Of Equivalent (DOE). Claims 1-3, 8-12, and 16-20 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Claim Rejections under 35 USC 103

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto. Claims 1 to 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elenius. Claims 8 to 12 and 16 to 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto or Elenius. Applicants respectfully traverse the rejections for at least the reasons set forth below.

1. In present invention, FIG. 2 discloses the features as recited in currently amended independent claim 1.

In FIG. 2 as the example, the first passivation layer 214 exposes the bonding pad 216 and *has the recess 218*. Then, the redistribution layer 220 is formed over the exposed bonding pad

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216 and the first passivation layer 214, including covering over the recess 218.

Please also note that the redistribution layer 220 as defined in the present invention includes the portion in contact with the bonding pad 216, the portion in contact with the recess, and the extending portion between the bonding pad 216 and the recess 218.

It also should be noted that the opening in the second passivation layer 230 has exposed the side peripheral portion and the bottom portion. As a result, the recess can improve the bonding strength between the bump 250 and the redistribution layer 220. In other words, the recess renders nonobvious and produces unexpected results.

Particularly to amended dependent claim 3, as for example shown in FIG. 2, *the under-bump-metallurgy layer 240 is formed in the opening of the second passivation layer 230 and extends over an upper surface of the second passivation layer. This portion of the second passivation layer 230 between the redistribution layer 220 and the under-bump-metallurgy layer 240 can serve as a stress buffer in mechanical effect. The prior art further failed to disclose this features as recited in claim 3.*

2. In re Hashimoto, as shown in Fig. 10C, Applicants respectfully disagree that the Office Action refers to intermediate layer 108 as the first passivation layer of the claimed invention.

Hashimoto clearly discloses that the passivation layer 106 is formed on the active surface 102a avoiding an electrode 104 (col. 12, lines 25-27). *In other words, the electrode 104 is exposed by the passivation layer 106, which is to be compared with the first passivation layer*

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214 of the present invention. Clearly, the passivation layer 106 of Hashimoto does not have the recess.

3. However, the Office Action disagrees the Applicant's argument and insists that the layers 106 and 108 are considered together as a first passivation layer. Even if it is in this situation, Hashimoto still fails to disclose the features of the present invention as recited in amended independent claim 1 and further in independent claim 1.

The wire 110 of Hashimoto is considered as the redistribution layer. The depression 108a is formed in the layer 108. Clearly, the wire 110 does not extend over the depression 108a at all. Further, the bump 114 does not fill into the depression 108a. It can be seen that the depression of Hashimoto is a free space and is not used to fill the bump. Therefore, Hashimoto disclose the different structure from the present invention and is for different purpose.

4. In re Elenius, based on the disclosure by Elenius, the metal layer has the bump pad 26, redistribution layer 30, and the contact 32 (col. 7, lines 32-35; Fig. 2). The Office Action has referred to the contact 32 as the claimed redistribution layer. It also noted that the Office Action has considered the redistribution layer 30 to be different from the contact 32 (see page 5, point 3 in Office Action). If it is so, Elenius failed to disclose the claimed redistribution layer as recited in independent claim 1 and the dependent claims 2-3, 8-12 and 16-20.

5. However, if the Office Action takes the bump pad 26, redistribution layer 30, and the

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contact 32 as the redistribution layer as recited in independent claim 1, Elenius still failed to disclose the present invention. The opening of the passivation layer 33 only exposes a portion of the bump pad 26 and does not expose the whole recess. In this situation of Elenius, the bump 28 only contact a portion of the bump pad 26. This is different from the present invention.

Therefore, independent claim 1 is distinguishable over the prior art. With at least the same foregoing reasons, dependent claims 2-3, 8-12, and 16-20 are distinguishable over the prior art.

6. Further with respect to dependent claim 2, the depression 108a of Hashimoto is not used to fill the bump. Further, the recess of the passivation layer 24 in Elenius is substantially a vertical sidewall but not an obtuse angle.

It should be noted that the obtuse angle of the present invention is used to improve the bonding strength.

7. Further with respect to claim 3, in re Hashimoto, the conductive foil layer 112 is at side of the wire 110, which has been considered as the redistribution layer by the Office Action. The conductive foil layer 112 does not disclose the under-bump-metallurgy layer of the present invention.

Further in re Elenius, the layer 30 is considered as the under-bump-metallurgy layer of the present invention. However, the layer 30 is the redistribution layer 30 (col. 7, lines 32-35), and

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cannot be disposed above itself. In other words, Elenius does not disclose the under-bump-metallurgy layer 240 of the present invention, as recited in claim 3.

As mentioned above at point 1, claim 3 further recites the features that *the under-bump-metallurgy layer 240 is formed in the opening of the second passivation layer 230 and extends over an upper surface of the second passivation layer*. Prior art failed to disclose the features.

8. With at least the foregoing reasons applied to independent claim 1, the prior art references do not fully disclose the features as recited in independent claim 1, and therefore do not disclose the features as recited in dependent claims 2-3, 8-12 and 16-20. Wherein, claims 2-3 at least further define over the prior art references.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-3, 8-12, and 16-20 of the invention patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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